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REPLY COMMENTS OF THE UTILITY REFORM NETWORK, THE CENTER FOR ACCESSIBLE TECHNOLOGY, AND THE NATIONAL CONSUMER LAW CENTER ON THE HARDENING ACR

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Table of Contents

I. INTRODUCTION

Pursuant to the August 9, 2019 Assigned Commissioner's Ruling Requesting Information on Hardening Communications Infrastructure and to Ensure Customer Access to 911 at All Times ("Hardening ACR"), The Utility Reform Network ("TURN"), the Center for Accessible Technology ("CforAT") and the National Consumer Law Center ("NCLC") (collectively, "Joint Consumers") hereby file these Reply Comments in response to the comments submitted by respondents to the questions set forth in the Hardening ACR.

Joint Consumers applaud the Commission's efforts to address the hardening of telecommunications networks. We anticipate that the Commission will formally expand the scope of R.18-03-011 to include the network hardening issues raised in the Hardening ACR and likely other issues referred from I.14-05-012, the Rural Call Completion proceeding[1]. While these reply comments are filed in response to the Hardening ACR in this Emergency Disaster Relief proceeding, we wish to point out that it is important to recognize that the need to address network hardening goes beyond declared emergency or disaster situations. As the CPUC's paper on Safety Principles for Communications Providers[2] pointed out and the 2015 telecommunications outage in Mendocino County[3] demonstrated, outages that occur in situations that are not caused by disasters or initially recognized as a state of emergency can cause a complete loss of communication services for an entire region. This includes emergency

[1] *See e.g.*, Transcript of Workshop in R.18-03-011 held on November 1, 2018 at 47:8-15; R.18-03-011, I.14-05-012, Administrative Law Judge's Ruling Entering the Record from Investigation 14-05-012 to Rulemaking 18-03-011, September 13, 2019.
[2] *See* Joint Administrative Law Judges' Ruling Entering *Safety Principles for Communications Service Providers* Into the Records of Rulemaking18-03-011 and Rulemaking 19-12-005 (Not Consolidated) (filed April 8, 2019); Joint Administrative Law Judges' Ruling Denying Motion to Strike Rulemaking18-03-011 and Rulemaking 19-12-005(Not Consolidated) (filed July 7, 2019).
[3] CPUC, *Safety Principles for Communication Providers,* 2019 at p.2.

communications, the ability to reach 9-1-1 emergency services or receive wireline and wireless alerts, access to medical documents, the inability to obtain any information (Internet, radio, television) and all electronic transactions conducted with credit card and ATM machines.[4] And if a network is thus compromised and a broader disaster occurs while communication is out, the risk to public safety increases further. Joint Consumers appreciate the Commission's attention to network hardening issues, which has been raised in several rulings including the Hardening ACR, and urge that the Commission take prompt action to formally expand the scope of this proceeding to include network hardening to minimize outages, or their impacts, including outages that are caused by events other than disasters that trigger states of emergency. For instance if a backhoe or a truck damages a section of fiber optic cable, that would likely not be deemed a "disaster" triggering a gubernatorial declaration, but the impact on an affected community (particularly a rural or isolated community) could be significant, as residents of many communities in California can attest.[5]

As discussed in Section II, below, the carrier responses to the questions posed in the ACR regarding infrastructure hardening are vague at best and almost dismissive, at worst. For example, AT&T begins its response with a claim that the questions posed by the Hardening ACR are "faulty because they assume communications providers can somehow design and build their networks to be impervious to disasters."[6] Another possibility (that apparently did not occur to AT&T) is that while a network may not be made impervious to a disaster, reliability and

[4] *See* CPUC, *Safety Principles for Communications Providers*, 2019, at p. 2; *see also* "September 2015 Telecommunication Outage and the Impacts on Residents of Mendocino County", North Bay/North Coast Broadband Consortium and Broadband Alliance of Mendocino County (December 2015) available at http://www.mendocinobroadband.org/wp-content/uploads/Outage-Report-as-approved-11216-by-BoS.pdf.
[5] CPUC, *Safety Principles for Communications Providers*, 2019, at p. 2.
[6] AT&T Response at p. 1.

resiliency can be improved and designed to minimize the harm to system functionality. For example, while Consolidated states that no carrier can ensure all customers have access to 911 "*at all times*," Consolidated has taken steps to harden the connection between legacy copper and fiber facilities in the event of a catastrophic event[7]. One such measure is burying short span copper drops between the customers' premises and remote terminals.[8] Furthermore, AT&T fails to acknowledge that significant disruptions to telecommunications lines occur due to incidents other than disasters. *e.g.,* malicious or accidental fiber cuts. The questions posed in the Hardening ACR reflect concerns expressed to the Commission by first responders at the Communications Division's May 20, 2019 En Banc concerning The Future of California's Telecommunications Grid[9] and at several public participation hearings in the Rural Call Completion proceeding (I.14-05-012). Joint Consumers believe these are essential issues for the Commission to address if it is to carry out its statutory obligation to assess the reliability of the state's public telecommunication networks and network resiliency under stress.[10]

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[7] Consolidated Opening Comments at p. 3.
[8] *Id.*
[9] *See* "The Future of California's Communications Grid, En Banc Hearing Summary, May 20, 2019" (July 8 2019) available at https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Communications_-_Telecommunications_and_Broadband/Future%20of%20CA%20Communications%20Grid%20En%20Banc%20Summary%20FINAL%20formatted%201.2.pdf (Among other topics, the En Banc addressed the issue of how will the increasing frequency and size of natural disasters strain the state's communications grid in the coming years).
[10] *See, e.g.*, Public Utility Code § 2889.8, which states that "The commission periodically shall assess the reliability of the public communications network and, if necessary, develop recommendations for improvement. The assessment shall include, but not be limited to, all of the following:
(a) An analysis of those factors that pose a risk to network reliability, including the adequacy of independent sources of reserve power.
(b) Consideration as to whether development of reliability standards is appropriate.
(c) Consideration as to whether procedures should be developed to notify customers about accessing other telecommunications companies in the event of a service disruption."

In addition to expanding the scope of the proceeding, the Commission should take further steps to verify the claims being made by carriers in response to the questions in the Hardening ACR. Many providers point to compliance with G.O. 95 (overhead line construction, inspection/ maintenance schedule), G.O. 128 (underground line construction, inspection/ maintenance schedule), and G.O. 133 (service quality), and to documentation provided to the Commission or other state agencies in the form of various reports. The Commission should review and verify pertinent claims by the carriers regarding inspections and compliance. As discussed further below in Section III, information unearthed in other proceedings, including those pertaining to Service Quality (R.11-12-001) such as the forthcoming Network Examination of AT&T and Frontier's wireline networks, Rural Call Completion (I.14-05-012) and the Sprint/T-Mobile Merger (A.18-07-011), can provide relevant context for the Commission to consider when evaluating carrier responses and determining next steps.

II. CARRIERS PROVIDED INADEQUATE RESPONSES TO THE QUESTIONS SET FORTH IN THE ACR.

In this proceeding, the Commission has been attempting to directly assess the ability of California's telecommunications system to remain functional and resilient during and immediately following a disaster so that Californians can access emergency information, first responders can provide assistance, and public safety can be protected to the maximum extent possible. Prior to issuing the Hardening ACR, the Commission previously requested information from communication service providers on wireless system hardening and emergency resilience in a Joint Assigned Commissioner and Administrative Law Judge's Ruling issued on February 5, 2019[11], and adopted the *Safety Principles for Communications Service Providers* Report into the

[11] Assigned Commissioner and Joint Administrative Law Judge's Ruling Seeking More Information on Emergency Disaster Relief Program (Not Consolidated) (filed February 5, 2019).

record through a ruling issued on April 8, 2019[12]. On July 9, 2019, a further ruling denied a motion to strike the *Safety Principles* Report from the record.[13] In opposing the motion to strike, TURN and CforAT noted:

> The [Safety Principles] Staff Report sets out to identify "regulatory and statutory gaps in communications" that "if addressed, would significantly enhance public safety." The Staff Report analyzes the record of this proceeding [Disaster Relief], including material previously incorporated from the record of yet another proceeding, I.14-05-012 (Rural Call Completion), as well as more recent evidence regarding of the performance of communications networks and providers in emergency situations, address ways that deficiencies in communications networks, failures of coordination, and gaps in regulatory and statutory mandates could be cured to enhance public safety. Most—if not all—of the issues identified as regulatory and/or statutory gaps in the Staff Report were previously identified or discussed in the record of this proceeding or the Rural Call Completion Proceeding (I.14-05-012), which is now part of the record here.[14]

The Commission agreed with regard to the importance of this report and the relevance of issues of communications reliability as it relates to public safety during and after disasters. Indeed, the Commission has now repeatedly noted the importance of a pending suite of proceedings to address important aspects of resilience and reliability of communications services in emergencies, including specifically this proceeding.[15] Subsequently, the Commission issued the Hardening ACR seeking further information from carriers about their efforts to increase reliability and resilience.

Notwithstanding the Commission's clear concern about the resilience and reliability of communications services during emergencies and its ongoing efforts to obtain useful information

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[12] Joint Administrative Law Judges' Ruling Entering *Safety Principles for Communications Service Providers* Into the Records of Rulemaking18-03-011 and Rulemaking 19-12-005 (Not Consolidated) (filed April 8, 2019).
[13] Joint Administrative Law Judges' Ruling Denying Motion to Strike Rulemaking18-03-011 and Rulemaking 19-12-005(Not Consolidated) (filed July 7, 2019).
[14] Response of TURN and CforAT to the Motion to Strike Safety Principles for Communications Providers from the Record, filed on 5/21/19 in R.18-03-011 and R.18-12-005 (Not Consolidated), at p. 4.
[15] *See e.g.* Joint Administrative Law Judge's Ruling Denying Motion to Strike, issued on July 9, 2019 in R.18-12-005 and R.18-03-011 (Not Consolidated) at p. 2.

from service providers about their system hardening efforts, the comments submitted by carriers in response to the Hardening ACR are overwhelmingly inadequate. While Joint Consumers address the carriers' specific (limited) responses directly below, we note here that the carriers overwhelmingly declined to meaningfully respond to the Ruling's request that they provide specific information and detail about their actions and efforts.

Where the Hardening ACR asked carriers to "describe actions taken to harden the communications infrastructure for risk" including "identification of specific locations" that may be important for first responders,[16] the carriers responded with generalities. Frontier characterizes every dollar it spent on its network in California as hardening (while also questioning the notion of "hardening" as relevant to resiliency).[17] Sprint goes even further by identifying only its "national capital expenditure" and saying it included "substantial expenditures" in California that served multiple functions that are not necessarily related to system hardening.[18] T-Mobile makes no attempt to directly respond to the questions presented on system hardening and instead focuses on its emergency relief policies and practices.[19] AT&T simply asserts that its "network is massive and constantly being improved;" it then identifies several categories of network improvement projects without providing any specificity whatsoever on work that has actually been done in California.[20]

In response to the same question, not a single carrier provided information on specific locations where hardening took place, generally referring instead to system elements such as

[16] Hardening ACR at p. 2 (Question 1).
[17] Frontier Opening Comments at p. 2.
[18] Sprint Opening Comments at p. 3.
[19] T-Mobile Opening comments at pp. 6-8.
[20] AT&T Opening Comments at pp. 1-2.

central offices and PSAPs ,[21] Master Telecommunications Centers,[22] hubs,[23] or headends.[24] The Small LECs make no effort whatsoever to respond individually and instead provide general descriptions of the types of actions they may take,[25] without any acknowledgement that their territories may reflect different levels of risk that require different forms of action. U.S. Cellular refers to its submission of a Hazardous Materials Business Plan via the California EPA's Environmental Reporting System, with no explanation of how this report relates to the inquiry put forward by the Commission.[26]

The Hardening ACR then asks about actions taken by carriers to harden the connection between fiber and legacy copper in their networks.[27] Joint Consumers recognize that this question is not applicable to those carriers who do not have networks that contain legacy copper, but those that do again fail to provide substantive information in response to the question. AT&T, the provider with one of the most massive legacy copper networks, simply fails to address the issue in any way in its opening comments, which do not mention "copper" at all. Frontier merely references its total spend on network improvements, while acknowledging that "these improvements to not necessarily take the form of 'hardening' the connection between 'fiber and legacy copper,'"[28] which is the actual question asked. Consolidated states that it has buried short span copper drops "where possible" without giving any information on the standards it uses to determine what is possible or the extent to which it has acted.[29]

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[21] Frontier Opening Comments at p. 3.
[22] Cox Opening Comments at p. 2.
[23] Cox Opening Comments at p. 2, Charter Opening Comments at p. 2.
[24] Comcast Opening Comments at p. 3, Charter Opening Comments at p. 2, Suddenlink Opening Comments at p. 3.
[25] Small LECs Opening Comments at pp. 2-3.
[26] U.S. Cellular Comments at p. 3.
[27] Hardening ACR at pp. 2-3 (Question 2).
[28] Frontier Comments at p. 3.
[29] Consolidated Comments at p. 3.

The final question put forth in the Hardening ACR addresses actions taken by carriers to harden infrastructure to ensure access to 911 service, again asking for "specific locations and the backup power (type of power, length of time power can function) at these sites."[30] Again, the responses fail to provide information on specific locations and only speak in generalities about available backup power. Multiple carriers describe various forms of backup power for various elements of their network without providing information on how many of each type are in place or the length of time any option can function.[31] Frontier points to prior reports, the most recent of which was provided to the Commission in March of 2019, with no attempt whatsoever to describe more recent activity.[32] T-Mobile fails to address backup power specific to 911 service at all and instead discusses the value of wireless networks in general.[33] Small LECs assert that the question is unclear and decline to provide any information.[34]

These references to specific responses by carriers are only examples of the overall lack of substantive responses. Collectively, the responses by carriers do not demonstrate a meaningful effort to provide the information sought by the Commission; rather they reflect an ongoing pattern by the carriers to obscure information and deny the Commission's ability and authority to effectively oversee disaster relief efforts involving the telecommunications network.[35] This

[30] Hardening ACR at p. 3 (Question 3).
[31] *See e.g.* Consolidated Opening Comments at p. 4; Charter Opening Comments at p. 3; Suddenlink Opening Comments at p. 3; U.S. Cellular Opening Comments at p. 4.
[32] Frontier Opening Comments at p. 4.
[33] T-Mobile Opening Comments at pp. 8-9.
[34] Small LECs Opening Comments at p. 4.
[35] *See e.g.,* Petition of CTIA for Modification of Decision 18-08-004 Affirming the Provisions of Resolutions M-4833 and M-4835 As Interim Disaster Relief Emergency Customer Protections (September 19, 2018); Motion Of AT&T, CTIA, Sprint, T-Mobile and Verizon Wireless To Strike Safety Principles For Communications Service Providers From The Record (May 6, 2019); California Cable and Telecommunications Association Comments on Proposed Decision of President Picker Adopting an Emergency Disaster Relief Program for Communications Service Provider Customers (August 5, 2019) at pp. 9-11; Comments of AT&T on the Proposed Decision (August 5, 2019) at pp. 6-11; and VoIP Coalition Application for Rehearing of Decision 18-0-004 Affirming the Provision of Resolutions M-4833 and M-4835 as Interim Disaster Relief Emergency Customer Protections. *See*, also, Protest of The

obstructionist behavior is consistent with the carriers' ongoing efforts to challenge the Commission's jurisdiction and avoid oversight of their role in disaster preparation that has been on display broadly in this proceeding and in the related suite of proceedings before the Commission addressing wildfire risk and other public safety matters. The Commission has repeatedly and appropriately noted the importance of reliable and resilient communications services in addressing disaster preparation and relief, and should continue to do so here, taking appropriate action to ensure that the carriers provide requested information and participate in the various efforts underway to support the safety of Californians in emergencies.

III. REPLY TO SPECIFIC ISSUES ADDRESSED BY CARRIERS IN RESPONSE TO THE QUESTIONS POSED IN THE ACR.

In addition to our concerns about the overall lack of responsiveness evident in the carriers' opening comments, Joint Consumers address several issues more directly, including concerns about route diversity, 9-1-1 and backup power for communications networks.

A. Route Diversity

Frontier and AT&T, the state's two largest wireline telecommunications providers, and Suddenlink address route diversity to some extent in their opening comments.[36] Frontier states that it has invested in route diversity,[37] and that "Wherever feasible, Frontier's network includes physical route diversity and ring technology that enhances the resiliency of remotes and central offices in the event of a fiber cut."[38] Suddenlink states that it "maintains redundant and diverse

Utility Reform Network, the Center for Accessible Technology and the National Consumer Law Center, of Frontier California Inc. Advice Letter 12815 and Frontier Communications of Southwest, Inc. Advice Letter 134; and Protest of the Center for Accessible Technology, The Utility Reform Network, and the National Consumer Law Center, of AT&T California Advice Letter No. 47953 and AT&T Mobility Advice Letter No. 166.

[36] Frontier Opening Comments at pp. 2-3; AT&T Opening Comments at pp. 5-6.

[37] Frontier Opening Comments at p. 2.

[38] Frontier Opening Comments at p. 3.

path architecture in our service delivery network, which may include diverse paths for linear transport as well as ring architecture."[39] AT&T, despite its status as one of California's major wireline carriers, does not actually address diverse routing at all with respect to its wireline network, instead it focuses on its wireless operations.

The Department of Homeland Security ("DHS") defines "Route Diversity" as "Communications routing between two points over more than one geographic or physical path with no common points."[40] DHS identifies Route Diversity as one of three critical elements to ensure the resiliance of a communications network, defined as the ability to withstand damages and thus minimize the likelihood of a service outage.[41]

Route diversity for fiber optic and microwave facilities is particularly important because in at least some areas of California, damage to a single fiber cable can wipe out all communication for a large region. Route diversity was a major topic of discussion at the July 16, 2016 public participation hearing held in Ukiah in the Rural Call Completion proceeding ("Ukiah PPH"). The Ukiah PPH occurred after Mendocino County had experienced at least two major communication disruptions due to fiber cuts in 2014 and 2015. The Chair of the Communications Committee for the Mendocino County Fire Chief's Association stated that earlier in 2016, AT&T representatives gave a presentation to the Mendocino County Board of Supervisors "in which they stated that in response to the 2014 and 2015 fiber outages, they had made software changes to improve resiliency. They said it is not necessary to do anything

[39] Suddenlink Opening Comments at p. 2.
[40] Department of Homeland Security Route Diversity Project, https://www.dhs.gov/sites/default/files/publications/Route Diversity Project Fact Sheet 6-9-16 Final 508.pdf. *See also*, DHS, Public Safety Communications Resiliency: Ten Keys to Obtaining a Resilient Local Access Network (July 2017) at p. 1. Available at: https://www.dhs.gov/sites/default/files/publications/07202017_10_Keys_to_Public_Safety_Network_Resiliency_010418_FINAL508C.pdf.
[41] *Id*.

physical other than the software change."[42] He asked whether the CPUC or another independent entity had "tested these fixes to see if they actually work."[43] Several speakers, including the Mendocino County Sheriff, called for diverse routing.[44] Following the 2017 fires, Humboldt County supervisors expressed their frustration that AT&T's "resiliency" effort had failed, and called for "'the more solid solution'" which "would be the diverse routes of redundant broadband fiber lines."[45]

During the October 2017 fires that wreaked havoc in Mendocino, Sonoma, Lake and Napa Counties, approximately 2 miles of a fiber optic cable owned by AT&T was burned in the Mendocino County Redwood Fire. The damage to the fiber cable knocked out all telephone company wireline service that relied on AT&T facilities and wireless service located North of the damaged portion of the line, including portions of Mendocino, Humboldt and Del Norte Counties; it also affected radio stations (which rely on wireline telecommunication lines) and caused a 9-1-1 outage in the city of Arcata.[46] In Humboldt County, two communication networks that *didn't* fail were Suddenlink and Humboldt County-based 101Netlink, both of which reportedly utilize fiber facilities along Hwy 36 (a line running East-to-West), owned by PG&E and operated by Level 3. A spokesman for 101Netlink stated that the company also uses microwave towers along the Hwy 101 corridor in Mendocino County and that those towers did

[42] I.11-03-013, Workshop/Public Participation Hearing, WS-4, Ukiah, California, July 16, 2016, TR. 440: 3-10.
[43] I.11-03-013, Workshop/Public Participation Hearing, WS-4, Ukiah, California, July 16, 2016, TR. 440:11-12.
[44] I.11-03-013, Workshop/Public Participation Hearing, WS-4, Ukiah, California, July 16, 2016, TR. 447: 9 - TR. 449:11 (Sheriff Allman).
[45] *Op. cit*. Eureka Times-Standard, *AT&T outage renews calls for diverse, redundant fiber lines into Humboldt County (*Oct. 12, 2017) Updated July 30, 2018.
[46] Redheaded Blackbelt, News, Nature and Community Throughout the Emerald Triangle, *[UPDATE 12:16 P.M.] TV and Phone Services Down On the West Coast*, October 9, 2017. Available at: https://kymkemp.com/2017/10/09/tv-and-phone-services-down-on-the-west-coast/.

not burn, "…but if they had, service to the Humboldt County region would not have been impacted because of the redundant line.[47]

The Humboldt County experience during the 2017 fires begs the question -- if Suddenlink and 101Netlink could utilize physically diverse routing to continue to provide essential telecommunications service, why didn't AT&T? And why did AT&T fail to address diverse routing regarding its *wireline* network in response to the ACR? The Commission should require AT&T to explain its failure to do so and to provide detailed answers to the ACR questions. The Commission should also request further information from Frontier about whether its phone and Internet service continued to function on California's North Coast following the damage to the fiber line in October 2017.

These examples of past situations where there was insufficient physical route diversity highlight the inadequacy of the carriers' responses to the Hardening ACR. The carriers should be compelled to provide substantive responses that actually address the availability of diverse routing and their investments in providing route diversity in order to improve reliability and resiliency.

B. Back-up Power Supporting Landline and Wireless Networks

The issue of back-up power for both wireline and wireless networks was posed by Question 3, which asked carriers to describe actions to harden infrastructure to ensure customer access to 911 at all times, to provide identification of specific locations and the back-up power

[47] Eureka Times-Standard, *AT&T outage renews calls for diverse, redundant fiber lines into Humboldt County* (Oct. 12, 2017) Updated July 30, 2018. Available at https://www.times-standard.com/2017/10/12/atampt-outage-renews-calls-for-diverse-redundant-fiber-lines-into-humboldt-county/ . Eureka Times-Standard, Humboldt County declares local emergency after fires down communication systems (Oct. 11, 2017) Updated August 30, 2018. Available at: https://www.times-standard.com/2017/10/11/humboldt-county-declares-local-emergency-after-fires-down-communications-systems-2/.

(type of power, length of time power can function) at these sites including central offices, head ends, remote nodes, repeaters, cell towers. All wireline and wireless providers stated that they had some generators and backup battery equipment to support their networks during catastrophic events. However, as discussed above in Section II and below, all of the responses were general in nature and the Commission should probe further to obtain clarification about the information provided by the carriers.

1. *Telephone Company Wireline Service*

For telephone company wireline service, carriers failed to address at least one significant issue -- back-up power to remote terminals. Robust back-up power at remote terminals is crucial for ensuring continuity of service during power outages. Remote terminals provide a termination point for copper loops that are then multiplexed via a high capacity line to the telephone company central office. In a power outage, if the power in a remote terminal dies, phone service for those customers does not function. Consolidated states that all of its sites have battery backup equipment that is connected to commercial power that keeps the batteries fully charged.[48] Frontier states that its 2018 investments "included enhancements to battery backup mechanisms…."[49] AT&T focused most of its response regarding back-up power on its mobile network but did state that it has back-up generators with additional back-up battery support at its central offices.[50] AT&T did not mention remote terminals.

Information provided in both the proceeding to consider the transfer of assets from Verizon to Frontier (A.15-03-005) and the Service Quality proceeding (R.11-12-001) highlighted the need for the Commission to have accurate information about back-up power to remote

[48] Consolidated Opening Comments at p. 4.
[49] Frontier Opening Comments at p. 4.
[50] AT&T Response at p. 7.

terminals. In A.15-03-005, the then Office of Ratepayer Advocates ("ORA") (now the Public Advocates Office, "PAO") submitted testimony drawing in part from prior Commission work on back-up power and testimony at A.15-03-005 public participation hearings.[51] Noting that many speakers expressed concern about adequate back-up power to remote terminals, ORA highlighted the testimony at the Rancho Mirage PPH of a retired Verizon employee with 40 years of experience who provided an analysis of pictures taken of remote terminals. According to the retired technician, the pictures demonstrated a lack of maintenance (sand in the cabinet), corroded batteries, and batteries in poor condition that "are lucky to get a half hour when the service goes out." He stated that the batteries are supposed to be checked routinely, "but that does not happen." A CWA representative at another PPH pointed out that pictures of batteries in remote terminals show that the batteries had expired.[52]

The analysis of the retired Verizon technician echoed information relayed to TURN and provided in 2013 comments submitted in R.11-12-001. TURN was contacted by a Verizon network technician in a rural area of Southern California expressing concern about Verizon's investment and repair practices. According to the technician, batteries are necessary to operate multiplexing equipment at facilities serving customers. During power outages, the batteries must function correctly for service to continue. According to the technician, until 2011, Verizon routinely inspected and maintained these batteries and the work was carried out by Verizon service technicians. As of 2011, the routine inspections and maintenance became sporadic and work was carried out by contract employees. When customers lost phone service, they would contact the Verizon repair line. The customer was told that it could take up to two weeks to "get

[51] A. 15-03-005, Office of Ratepayer Advocates Supplemental Testimony on Backup Power for Remote Terminals (Public Version), September 11, 2015
[52] *Id.*, at pp. 1-5 to 1-6.

someone out there" to restore service, but if the customer wished to switch to FiOS (the fiber-based service) the service can be provided right away.[53]

The concern about the inadequate response to the Hardening ACR's questions regarding back-up power, and the status of the back-up power itself, is not limited to telephone company networks. For example, Suddenlink states that in addition to stand-by power at the headend for every system, it "provides additional short-term backup power for other equipment incorporated into the network", but offers no explanation about its maintenance practices.[54]

2. *Wireless Service*

Similar concerns apply to back-up power for wireless networks. U.S. Cellular states that it has increased generator penetration throughout its network, it has taken actions to increase generator fuel quantities in areas where access is limited and "alternate means of transportation or egress are required during times of emergency."[55] These actions sound promising, however they lack any detail. For example, U.S. Cellular may be utilizing practices that could be applicable to other carriers or adopted as recommended practices by the Commission, but that cannot be determined without further detail. Sprint, T-Mobile AT&T and Verizon generally describe their back-up power deployment, providing more detail than U.S. Cellular.[56]

None of the carrier responses provide the type of information necessary for the Commission to assess the reliability of the back-up power in these wireless networks. For example, the issues raised about the maintenance of battery back-up for remote terminals apply

[53] R.11-12-001, Post-Workshop Reply Comments of the Utility Reform Network (TURN) and the California Association of Competitive Telecommunications Companies (CALTEL) (Feb. 28, 2013) at pp. 15-16.
[54] Suddenlink Opening Comments at p. 3.
[55] U.S. Cellular Opening Comments at 2.
[56] Sprint Opening Comments at p. 5; T-Mobile Opening Comments at pp. 4-5; AT&T Opening Comments at pp. 7-8; Verizon Opening Comments at p. 4.

equally to the battery back-up in wireless networks. Further, as the evidence in the T-Mobile/Sprint merger showed, the comments don't address key issues such as battery life declining with age and whether the standard battery back-up is sufficient to support service during times of emergency when additional back-up power might have to be trucked in over poor roads and long distances. While wireless carriers maintain national fleets of generators, whether there are sufficient generators in California is an open question, as is the issue of whether generators from a national fleet can be deployed in California quickly enough to avert a major network outage.

Back-up power in wireless networks was among the issues addressed in evidentiary hearings in the Sprint/T-Mobile proceeding, A. 18-07-011 and A. 18-07-012. Back-up batteries were stated to have varying degrees of battery life, falling within a range of hours, but no testimony from the carriers addressed detailed maintenance practices.[57] Both carriers stated that they have portable generators, but both carriers also stated that additional back-up power would be provided by portable generators located in other states that would have to be redeployed to California.[58] The evidence showed that T-Mobile has a longer time frame for redeploying portable generators from its nationwide fleet to California.[59]

T-Mobile's rebuttal testimony did not indicate how many portable generators are located in states close to California, so unless further information were provided to the Commission, the Commission has no way of knowing how long it would take T-Mobile to relocate additional portable generators to California. Another concern is that more than one state near to California may simultaneously face an emergency (such as a wildfire) that also requires the use of T-

[57] A.18-07-011/A.18-07-012, Public Advocates, Ex. 6-C at p. 37 (Reed).
[58] Id.
[59] A.18-07-011/A.18-07-012, Joint Applicants, Ex. 3-C, p. 51: 25-26 (Ray); Public Advocates, Ex. 6-C, p. 37: 23-25 - p. 38: 1 (Reed).

Mobile's fleet of generators, calling into question whether the additional back-up power for California would be further delayed. Further, getting out-of-state generators to California - or even moving them from one general part of the state to another - is one thing. It is another thing to haul the additional generators along often poorly maintained back roads in sparsely populated, mountainous areas, particularly when there is an on-going emergency involving a power outage necessitating the need for the back-up power. Two frequently experienced situations causing power outages are wildfires and damage from severe weather, both of which make transporting generators during emergencies very difficult. These issues are not unique to T-Mobile and would apply to any carrier faced with the task of bolstering back-up power in rural areas of the state. The fact that the Commission received more detailed information in the merger proceeding than was provided in response to the ACR can provide insight into the questions on backup power that the Commission should consider in this docket.

Back-up power for both wireline and wireless networks is a crucial component of network reliability. The Commission should obtain additional information from all carriers about aspects of back-up power such as,

- How often are batteries and generators tested?
- What is the actual remaining life vs. initial life of the batteries?
- Who conducts the testing?
- What are the company's official maintenance practices?
- Is there compliance with both company best practices and other best practices (industry or Federal Communications Commission)?
- What are the criteria for placing batteries vs. generators as sources of back-up power at communications facilities dependent upon commercial power?

•What are the criteria for replacing batteries?

•How would a carrier bolster emergency back-up power at remote sites during an emergency and are these plans sufficient?

•What are the carrier's specific plans for relocating generators, either from within California or from a national fleet, to areas hit by disasters in California, and are these plans realistic?

IV. CONCLUSION

Joint Consumers applaud the Comission's effort to address telecommunications network hardening. The Commission has considered issues related to network hardening and resilient telecommunications networks in other proceedings, including (but not limited to) R. 11-12-001, I. 14-05-012, A. 15-03-005 and A.18-07-011/A.18-07-012. The evidence and information from these dockets can inform the Commission going forward. Joint Consumers propose that the Commission issue a scoping memo encompassing network hardening issues, including the point that the scope should include preventing, mitigating and resiliency involving damage to facilities caused by events that do not trigger states of emergency. Further, Joint Consumers urge the Commission to dive deeper into the responses provided by carriers to the Hardening ACR, including asking the question posed by Joint Consumers in these comments pertaining to diverse routing and back-up power. We look forward to working with the Commission and parties to assist the Commission in ensuring that California's telecommunication networks are as reliable and resilient as possible.

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Respectfully,

/s/

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